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(Reaffirmed - 2012)

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(पहला पुनरीक्षण)

Indian Standard

GLOSSARY OF TERMS RELATING TO RIVER VALLEY PROJECTS

PART 15 CANAL STRUCTURES

Section 5 Cross-Drainage Works

(First Revision)

UDC 001·4 : 627·81 : 626·823·8

BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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Price Group 2

FOREWORD

This Indian Standard (Part 15/Sec 5) was adopted by the Bureau of Indian Standards, after the draft finalized by the Terminology Relating to River Valley Projects Sectional Committee had been approved by the River Valley Division Council.

A number of Indian Standards have been published covering various aspects of river valley projects and a large number of similar standards are in the process of formulation. These standards include technical terms, the precise definitions of which are required to avoid ambiguity in their interpretation. To achieve this end, the Bureau is bringing out this glossary of terms relating to river valley projects (IS 4410) which is being published in parts.

This part (Part 15) covers the important field of canal structures and in view of the vastness of this subject, it is covered in six different sections. Other sections in the series are as follows:

Section 1	General terms
Section 2	Transitions
Section 3	Flumes
Section 4	Regulating works
Section 6	Other structures

This standard (Part 15/Sec 5) was first published in 1977. Due to the information received from various states it was found necessary to revise this standard. The terminology as given in this standard has been finalized by the Cross Drainage Works Sectional Committee.

Indian Standard

GLOSSARY OF TERMS RELATING TO RIVER VALLEY PROJECTS

PART 15 CANAL STRUCTURES

Section 5 Cross-Drainage Works

(First Revision)

1 SCOPE

This standard (Part 15/Sec 5) covers the definitions of the terms relating to cross-drainage works.

2 TERMINOLOGY

2.1 Abutment

It is a masonry or plain or reinforced concrete structure, constructed at the end of the waterway of a canal/carrier channel to protect the banks from erosion, support the infrastructure load and retain the backfill while confining the flow to the desired waterway.

2.2 Abutment Pier

A heavy pier designed to withstand the horizontal component of unbalanced inclined thrust from the superstructure.

2.3 Afflux

The upstream rise of water level above the normal surface of water caused by an obstruction, resulting in contraction of the normal waterway.

2.4 Affluxed Check High Flood Level

Affluxed check high flood level is the level due to afflux created by the check flood.

2.5 Afflux Bund

An embankment or dyke designed to prevent outflanking of the cross drainage structure by the design flood.

2.6 Apron

Protective layer of stone or other material extending out from a structure to arrest erosion/scour.

2.7 Aqueduct

A cross drainage work in which the carrier channel is carried over the drainage and the bottom of the carrier channel or the covering over the drainage openings, is above the high flood level in the drainge channel.

2.7.1 *Trough Aqueduct*

It is a form of aqueduct in which the earthen banks of the canal are discontinued through the aqueduct and canal water is carried in a masonry, concrete, timber or steel trough, usually flumed.

The sides of the trough are connected on either sides of the work to the earthen banks of the canal by means of suitable transitions, if required.

2.7.2 *Syphon Aqueduct*

It is a cross drainage work in which the carrier channel is carried over the drainage channel with the drainage discharge carried under pressure through the structure. The bed of the drainage channel may or may not be depressed below its normal level.

2.8 Back Water Curve

The shape of the surface of water in a stream or open conduit along a longitudinal profile from a point upstream of a structure where such water surface is raised above its normal level.

2.9 Clearance

It is the vertical height between the design flood level (including afflux) of the stream, or the full supply level of the canal, and the lowest point of the superstructure.

2.10 Critical Flow Velocity

It is that velocity of flow at which the total energy of flow is minimum.

2.11 Critical Velocity

It is that velocity of the canal flow which is non-scouring and non-silting [*see* **4.13.3** of IS 4410 (Part V) : 1968].

2.12 Culvert

A cross drainage work in which the canal discharge is carried over the drainage channel with full section of canal/carrier channel, without fluming the section.

2.12.1 *Arch Culvert*

It is a culvert in which arch openings are provided for the drainage channel water, below the bed level of the canal/carrier channel.

2.12.2 *Box Culvert*

It is a culvert in which the drainage channel discharge is carried in a box or pipe under the bed level of the canal/carrier channel.

2.13 Check Flood

The check flood discharge is the value, enhanced over the design discharge to provide additional safety to the foundation in case of natural streams.

2.14 Cut Off Wall

It is a cross wall built under the floor of a hydraulic structure with the object of increasing creep length of water reducing uplift, attaining safe exit gradient and thereby reducing seepage of water.

2.15 Cut Water

It is the upstream nose of a pier shaped for streamlined entry of flow into the bays.

2.16 Design Flood

It is the estimated flood discharge used for design of the waterway, foundation of a particular work or its component works and connotes fixation of the flood magnitude after thorough consideration of the flood characteristic, including its frequency, in a drainage basin.

2.17 Design Storm

It is that estimate of rainfall depth, or amount, and its distribution over a particular drainage area which is accepted for determining the design flood.

2.18 Ease Water

It is the downstream nose of the pier, shaped to promote smooth emergence of the waters flowing out of the adjacent bay(s).

2.19 Fetch

It is the distance over which the wind can act on a body of water. It is generally defined as the maximum distance from the windward shore to the structure.

2.20 Free Board

It is the difference in levels between the maximum flow line including afflux, and the top of the embankment, guide bank or trough/box.

2.21 High Flood Level

It is the design flood level as in **2.16** above.

2.22 Level Crossing

It is a cross drainage work in which bed levels of the drainage channel and the canal are nearly the same. Drainage is admitted in the canals from one bank and escaped across the other.

2.22.1 *Inlet*

It is a work consisting of an opening in a canal bank, suitably protected, to admit upland drainage water into the canal.

2.22.2 *Outlet*

It is a cross drainage work consisting of an opening in a canal bank suitably provided to discharge excess water collected through the inlet into a natural stream.

2.23 Low Water Level

The low water level is the level of the water surface generally obtained during the dry weather flows.

2.24 Observed Flood

It is the maximum of the recorded floods, at a section of a stream, during a specific period, which may be a year or even the entire period of record.

2.25 N-Year Flood

It is a flood which has probability of being equalled or exceeded once in every N-Years or has one chance in N of occurring in any year.

2.26 Pier

It is a masonry or plain or reinforced concrete wall built in a drainage channel or canal, to divide the width of the channel or canal in a number of bays and to support vertical loads transmitted by the superstructure.

2.27 Probable Maximum Flood (PMF)

It is the largest momentary discharge rationally possible from considerations of the most critical combination of severe meteorological and hydrologic conditions in the area.

2.28 Scour Depth

Scour depth is the depth measured below check high flood level to indicate the limit up to which scour may occur due to water flow.

2.29 Substructure

It is that part of the cross drainage work which lies above the foundation but below the top of piers or abutments or below the springing line of arches.

2.30 Superstructure

It is that part of the cross drainage work which lies above the top of piers, abutments or above the springing line of arches.

2.31 Superpassage

It is a cross drainage work, the reverse of a canal aqueduct when the canal is passed under the drainage channel such that the full supply level of the canal leaves a sufficient free board from the underside of the drainage trough above it.

2.32 Syphon

It is a structure with a closed conduit, designed to run full and usually under pressure, to transport the canal water under the drainage channel. It is also referred to as irrigation syphon or canal syphon.

2.32.1 *Well Syphon*

It is a syphon in which wells are provided at each end of syphon.

2.33 Toe Wall

It is a shallow wall constructed at the junction of the toe of embankment or guide bund and the bed or floor to provide a footing for the pitching.

2.34 Uplift

It is the upward hydraulic pressure exerted on the base of a structure through the pores of the permeable bed beneath its base.

2.35 Wing Walls

These are protective walls joining the abutments of a structure to earth dykes or banks.

2.36 Transition Wall

It is a wall positioned between the normal section and flumed section of structure for smooth transition of flow.

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